Forests and Climate Change Working Paper 11

Forest Management and Climate Change: stakeholder perceptions

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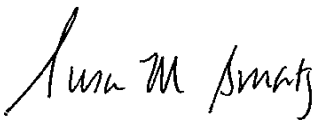
Foreword

This document is part of the publications series produced by the Forest and Climate Change Programme of FAO. The programme seeks to provide timely information and tools to a wide range of stakeholders, with the ultimate objective of assisting countries' efforts to mitigate and adapt to climate change through actions consistent with sustainable forest management.

FAO, in collaboration with forest management and climate change experts and relevant stakeholders, is currently developing guidelines to assist forest managers to understand, assess and implement climate change mitigation and adaptation measures. The guidelines will highlight adjustments that may be considered in the planning, implementation and monitoring phases of forest management to accommodate climate change considerations. They will be relevant for all forest types, all management objectives and all types of managers. To facilitate the development of the guidelines, FAO conducted an online survey of forest stakeholders. The survey sought to assess their perceptions of the impacts of climate change on forests and the impediments that limit the ability of forest managers to prepare and respond to climate change.

This publication presents a summary of the results of the survey. A complete set of the results are available on the FAO Forests and Climate Change Programme website (www.fao.org/forestry/climatechange/en/). The publication will be of interest to forest managers, policy-makers, researchers, students, communications specialists and general audiences interested in forests and climate change.



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The publication has been developed with the financial support from the FAO-Finland Forestry Programme "Sustainable forest management in a changing climate".

For more information, contact Simmone Rose, Climate-Change-Forest-Managers@fao.org.

INTRODUCTION TO SURVEY

FAO, in collaboration with forest management, climate change experts and relevant stakeholders, is developing guidelines to assist forest managers to effectively respond to climate change challenges and opportunities. These guidelines will include actions related to both climate change adaptation and mitigation and will be relevant to all types of forests, all management objectives and all types of managers.

To facilitate the development of the guidelines, a survey was conducted through which forest stakeholders provided their views and perceptions on factors that influence the ability of forest managers to respond to climate change.

The survey was conducted between May and July 2011 and was disseminated through international, regional and local forestry associations, networks and electronic list-serves. These included the FAO Forestry and Climate Change newsletter - Clim-Fo-L, the IISD mailing list - Forests-L, members of the Advisory Committee on Paper and Wood Products (ACPWP), 128 national and regional forest industry associations and community forest users groups, heads of forest services in 168 countries and members of the Collaborative Partnership on Forests (CPF). In all cases the request was made for the survey to be on forwarded to the membership of the various organizations.

There were a total of 25 questions (Annex I) covering the following areas:

- impact of climate change on forests,
- importance of climate change,
- national climate change laws and regulations,
- climate change related adaptation and mitigation responses,
- capacities and support to undertake climate change adaptation and mitigation and,
- relevance of climate change guidelines for forest managers.

In the first section on the *impact of climate change on forests*, respondents were asked whether they thought that climate change had affected forests in their countries and if so, what was the nature of the impacts.

They were then asked about the *importance of climate change* relative to other listed forest management challenges, the climate change effects considered particularly important from a forest management perspective and future climate change impacts on forests and people.

The following section examined respondents' awareness of *national climate change laws and regulations* affecting forests and whether they had made changes to their management plans or practices based on this legislation.

The section on *climate change related adaptation and mitigation responses* sought to ascertain whether respondents had made changes to management plans and practices based on changing climate and the impacts that international financial mechanisms (climate change financing) may have on forest management.

Questions in the next sections focused on *capacities and support to undertake climate change adaptation and mitigation actions*. Here respondents were asked about their level of understanding of climate change impacts on forests and the mitigation and adaptation options. They were also asked whether they felt that they had the capacity to undertake these

actions and to identify some of the main constraints to implementing these actions. Respondents were requested to indicate the current level of support they received for climate change actions and to specify what assistance they required to implement climate change actions. Finally, respondents were asked to provide views on the usefulness of *climate change guidelines for forest managers* - a tool that could assist them in responding to climate change challenges and opportunities.

Respondents were grouped according to:

- geographic region - Africa, Asia and the Pacific, the Near East, Latin America and the Caribbean, North America and Europe;
- stakeholder group - the public and private sectors, community forest users groups, nongovernmental organizations (NGOs) and the research and education community,
- role in respective organizations - policy and planning, operational or marketing and;
- objective for which forests are managed - timber production, soil and water protection, biodiversity conservation or multi-purpose management.

For most questions, there were four levels possible for responses (e.g. extremely important to not important, high impact to no impact or well understood to don't know). In most cases responses were merged *i.e.* extremely important, important and somewhat important were combined and represented as important, and high, medium and low impacts were combined and reflected as impact. Responses of 'don't know' were not included in the analysis unless they added value to the findings.

RESULTS

Four hundred and twenty six responses were received from 90 countries. Of these only 242 respondents completed the entire survey. Because some questions were optional and could be skipped, the number of responses per question varies throughout the survey.

All regions (*i.e.* Africa, Asia and the Pacific, the Near East, Latin America and the Caribbean, North America and Europe) and all stakeholder groups (*i.e.* the public and private sector, community forest users groups, nongovernmental organizations and the research and education community) were represented. Due to the low number of respondents from the Near East region (9) and the community forest users groups (7), data from this region and stakeholder group were not considered representative and therefore not included in the analysis of the results. In any event, the results should be seen only as indicative, as there is no way to determine how representative they are of the regions and sectors.

As indicated earlier, a full summary of the results (including the Near East Region and the Community Forest Users Groups) is available on the FAO Forests and Climate Change Programme website (www.fao.org/forestry/climatechange/en/).

General information about respondents

There was some variation in the number of responses received from the different regions. The largest number of responses was received from Europe (39%) and the lowest from Latin America and the Caribbean (12%). The remaining regions had similar response levels to the survey (Table 1).

Table 1. Representation among surveyed respondents

Region	**Respondents (%)**
Africa	17
Asia Pacific	16
Europe	39
Latin America and the Caribbean	12
North America	16
Stakeholder group	
Public sector	37
Education or research organization	24
Private sector	21
Nongovernmental organization	12
Other	6
Working experience (years)	
0 - 4	15
5 – 9	16
10 - 14	17
15 or more	52
Gender	
Male	82
Female	18

There was a similar variation when responses were grouped according to the stakeholder groups. The majority of the respondents were from the public sector (37%), 21% from the private sector and 12% from NGOs (Table 1). Most of the respondents (69%) claimed to have more than 10 years of experience in forest management and over four-fifths of the respondents were male. Female representation was highest (23%) in Europe, NGOs and the public sector.

Most respondents were involved in activities related to policy and planning (58%) and operational tasks (39%), while 3% of respondents were involved in marketing. Thirty-nine percent of respondents were engaged in multi-purpose forest management, while biodiversity conservation was the main objective for 25% of respondents and timber production was the main objective for 19%.

Importance of climate change

Climate change was ranked as least important challenge (90% of the respondents) when compared to other forest management challenges, such as land use conflicts, governance issues, limiting or perverse government policies, economic factors, access to financial resources and lack of information or technical assistance (Table 2). Overall, respondents highlighted economic challenges as the most important faced by forest managers. However there was much variation among the regions in this regard. Respondents from Africa, Asia and the Pacific and Latin America and the Caribbean highlighted lack of information and technical assistance as their most important challenge. Land use conflicts were most important for respondents from North America and were considered very important by respondents from Africa and Latin America and the Caribbean.

Table 2. Forest management challenges ranked according to responses – overall and within regions

Challenges	Overall Rank	Africa	Asia & the Pacific	Europe	Latin America & the Caribbean	North America
Economic challenges	**1**	3	5	1	2	3
Lack of information and/or technical assistance	**2**	1	1	3	1	2
Land use conflicts	**3**	2	6	6	2	1
Governance issues	**3**	5	2	2	4	5
Access to financial resources	**5**	5	3	5	4	4
Limiting or perverse government policies	**6**	4	3	4	6	6

Impact of climate change

There was generally a high awareness of the changing climate among the respondents, with 91% of them having noticed changes over the last few decades. Respondents from Africa and NGOs were the most aware of changes in climate while respondents from North America and the private sector were the least aware.

Respondents that were aware of climate driven changes, considered that trends such as increases in extreme weather events, changes in water availability, more frequent and severe fires, more outbreaks and damage by pests and diseases and altered forest productivity and ecosystem services, currently had an **impact on forests**. Increases in extreme weather events were indicated as having the biggest impact in all regions.

On the other hand, climate changes' role in increasing the frequency and severity of fires was considered as having the least impact in all regions except Latin America and the Caribbean, where fires were considered to be a more important impact of climate change. Respondents from Latin America and the Caribbean and Africa considered changes in water availability as important as an increase in extreme weather events (Figure 1).

Respondents were then asked to indicate whether climate change impacts on forests would **affect forest management**. All climate change impact options listed were considered to have potential significant effects on forest management (>90% of respondents to each impact option). Increases in extreme weather events were again ranked as having the greatest probable impact, and increases in the number of invasive species were considered to have the least probable impact. There was however, some variation among the regions *e.g.* respondents from North America considered forest fires as having possibly the greatest impact on forest management while respondents from Africa thought that altered forest productivity and ecosystem services and more pests and diseases would potentially have the greatest impacts on management (Figure 2). The latter impact was also relevant for respondents from Asia and the Pacific region.

Figure 1. Impacts of climate driven trends on forests

Decreasing impact

Africa	Increase in extreme weather events	Increase/decrease in water availability	Changes in forest habitat and biodiversity	More outbreaks and damage by pests and diseases	Altered forest productivity & ecosystem services	More frequent and severe forest fires
Asia & the Pacific	Increase in extreme weather events	Changes in forest habitat and biodiversity	More outbreaks and damage by pests and diseases	Altered forest productivity & ecosystem services	Increase/decrease in water availability	More frequent and severe forest fires
Europe	Increase in extreme weather events	More outbreaks and damage by pests and diseases	Changes in forest habitat and biodiversity	Altered forest productivity & ecosystem services	Increase/decrease in water availability	More frequent and severe forest fires
Latin America & the Caribbean	Increase in extreme weather events	Increase/decrease in water availability	More frequent and severe forest fires	Changes in forest habitat and biodiversity	Altered forest productivity & ecosystem services	More outbreaks and damage by pests and diseases
North America	Increase in extreme weather events	More outbreaks and damage by pests and diseases	Increase/decrease in water availability	Changes in forest habitat and biodiversity	Altered forest productivity & ecosystem services	More frequent and severe forest fires

Figure 2. Possible impacts of climate driven trends on forest management

Decreasing impact of climate trends on management

Africa	More pests & diseases	Altered forest productivity & ecosystem services	Decrease in water availability	Increase in extreme weather events	More forest fires	Increase in no. of invasive species	Increase in no. & occurrence of natural disasters
Asia & the Pacific	More pests & diseases	Increase in extreme weather events	Decrease in water availability	More forest fires	Increase in no. of invasive species	Increase in no. & occurrence of natural disasters	Altered forest productivity & ecosystem services
Europe	Increase in extreme weather events	More pests & diseases	Altered forest productivity & ecosystem services	Decrease in water availability	Increase in no. of invasive species	More forest fires	Increase in no. & occurrence of natural disasters
Latin America & the Caribbean	Increase in extreme weather events	Increase in no. & occurrence of natural disasters	More pests & diseases	Altered forest productivity & ecosystem services	Decrease in water availability	More forest fires	Increase in no. of invasive species
North America	More forest fires	Increase in extreme weather events	More pests & diseases	Decrease in water availability	Increase in no. of invasive species	Altered forest productivity & ecosystem services	Increase in no. & occurrence of natural disasters

Figure 3. Future impacts of climate change on forests and people

Decreasing impact of climate change

Africa	Change in quantity and quality of wood supply	Loss of forest ecosystem services	Uncertainty in the supply of wood and NWFPs	Loss of forest based employment	Loss of biodiversity	Higher production and delivery costs for forest products
Asia & the Pacific	Loss of forest ecosystem services	Uncertainty in the supply of wood and NWFPs	Loss of biodiversity	Change in quantity and quality of wood supply	Higher production and delivery costs for forest products	Loss of forest based employment
Europe	Loss of forest ecosystem services	Change in quantity and quality of wood supply	Loss of biodiversity	Uncertainty in the supply of wood and NWFPs	Higher production and delivery costs for forest products	Loss of forest based employment
Latin America & the Caribbean	Uncertainty in the supply of wood and NWFPs	Loss of forest ecosystem services	Change in quantity and quality of wood supply	Loss of biodiversity	Higher production and delivery costs for forest products	Loss of forest based employment
North America	Loss of biodiversity	Loss of biodiversity	Higher production and delivery costs for forest products	Change in quantity and quality of wood supply	Uncertainty in the supply of wood and NWFPs	Loss of forest based employment

When asked about the influence of secondary impacts of climate change, respondents were of the view that loss of forest ecosystem services, loss of biodiversity and a change in the quantity and quality of wood supply were the three most important factors that would **affect forests and people in the future**. Loss of forest based employment was ranked as having the least future impact. While the difference in the level of importance given to the listed impacts was not significant, there were some key differences amongst regions. Changes in the availability of forest products were most important for Africa, Asia and Latin America and the Caribbean while loss of ecosystem services and biodiversity were most important for Europe and North America (Figure 3).

Policy and legislation

Approximately 60% of respondents were aware of the existence of a national climate change regulatory framework (policies, strategies or legislation) that influenced the forest sector. Respondents from Asia and the Pacific region recorded the highest awareness, while respondents from North America had the lowest awareness. Amongst stakeholders, the public sector and NGOs were better informed than other groups regarding climate change regulations with the private sector being the least aware.

Respondents who indicated awareness of national climate change regulations were then asked whether they had made any adjustments to their forest management plans, practices or reporting procedures as a direct result of the regulations. Fifty-nine percent (59%) of these indicated that they had effected changes to their forest management actions as a consequence of the regulations. Although respondents from the Asia Pacific region had the highest awareness of the regulations, they had the lowest response rate amongst the regions in terms

of changes made to forest management as a result of the regulations (Figure 4). Africa was the region with the highest response to new climate change regulations.

Respondents were asked to indicate whether they had made modifications to their forest management plans or practices due to existing climate change impacts on their forests. Less than half of the respondents (47%) reported effecting forest management changes in this regard. The region with the lowest report of changes was North America followed by Africa (Figure 4). Among stakeholders, the trend was similar to that of the regional responses with respondents effecting changes to their management plans and practices as a result of regulations as opposed to actual changes in climate. NGOs were the only group category that diverged from this trend (Figure 5).

Figure 4. Adjustments to forest management plans and actions - regional perspectives

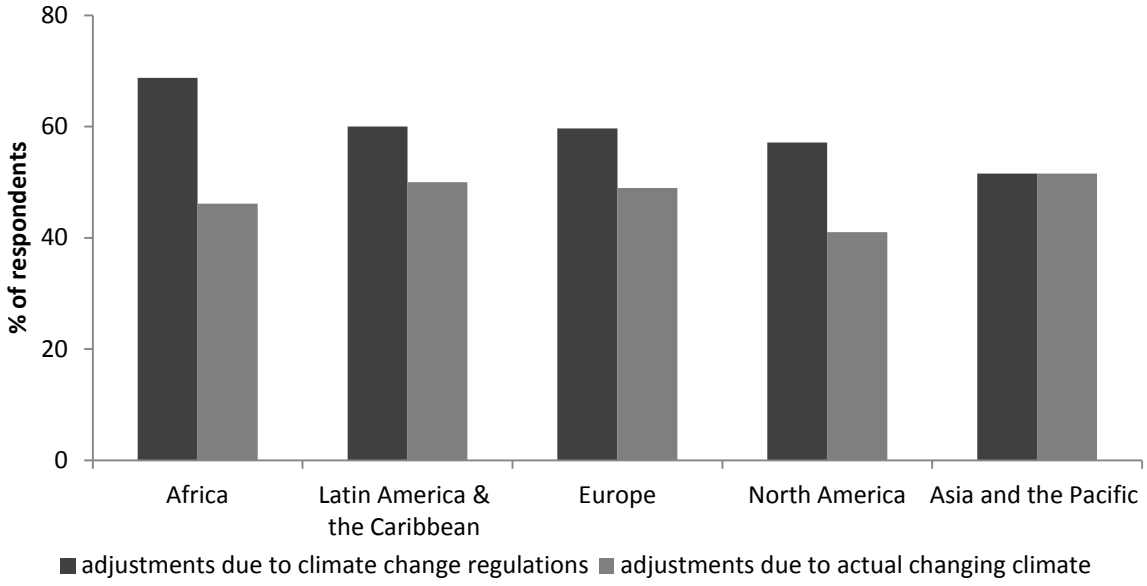
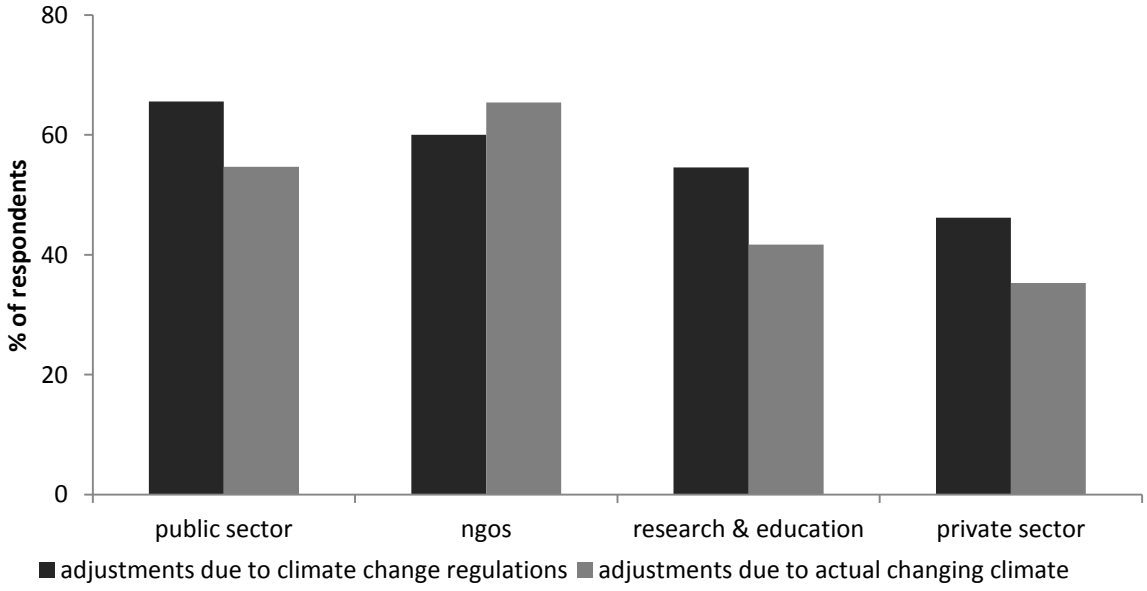


Figure 5. Stakeholders' response in terms of adjusting forest management plans



Adaptation and mitigation

When asked about their awareness and understanding of the effects of climate change on forests and of the adaptation and mitigation options for forests, respondents expressed a high level of awareness of the climate change effects on forests (95%) and of the adaptation (93%) and mitigation (91%) options for forests. Only 1% of respondents indicated unawareness of the effects of climate change. These respondents were from Europe and North America. Only 2% of respondents were unaware of forest adaptation and mitigation options.

Respondents were then asked to indicate whether they felt that they had the capacity to undertake climate change mitigation and adaptation actions. Sixty-six percent (66%) of respondents indicated confidence in their ability to carry out climate change adaptation and mitigation measures. Respondents from Africa and Europe expressed the highest confidence, while those from Asia and the Pacific region expressed the lowest confidence in their capacity. Of the stakeholder groups, NGOs indicated the highest confidence of being able to undertake mitigation and adaptation actions

Respondents were asked to point out what they felt were the main constraints forest managers faced when implementing climate change adaptation and mitigation measures. Six options were listed and respondents were able to choose all those that were relevant. The options were the *lack of finances or financial incentives, lack of technical knowledge, lack of clarity of existing regulations, lack of conviction that it is important, lack or poor access to information and lack of interest* (Figure 6). The most selected constraints were lack of finances or financial incentives (*n=192*), lack of technical knowledge (*n=154*) and lack of clarity of existing regulations (*n=116*). The least selected constraint was lack of interest in implementing climate change measures (*n=62*). For Europe and Latin America and the Caribbean, lack of conviction that climate change actions were important ranked high as a constraint.

Figure 6. Constraints limiting climate change adaptation and mitigation actions

Decreasing importance of constraints

Africa	Lack of finances or financial incentives	Lack of technical knowledge	Lack or poor access to information	Lack of clarity of existing regulations	Lack of conviction that it is important	Lack of interest
Asia & the Pacific	Lack of finances or financial incentives	Lack of technical knowledge	Lack of clarity of existing regulations	Lack or poor access to information	Lack of conviction that it is important	Lack of interest
Europe	Lack of finances or financial incentives	Lack of conviction that it is important	Lack of technical knowledge	Lack of clarity of existing regulations*	Lack or poor access to information*	Lack of interest
Latin America & the Caribbean	Lack of finances or financial incentives	Lack of conviction that it is important	Lack of technical knowledge	Lack of clarity of existing regulations	Lack or poor access to information	Lack of interest
North America	Lack of finances or financial incentives	Lack of technical knowledge	Lack of conviction that it is important	Lack of clarity of existing regulations*	Lack or poor access to information*	Lack of interest

** signifies equal importance given to constraint within region*

More than 60% of respondents felt that current and future climate change financial support mechanisms would have an impact on forest management. There was little variation in the ranking; support programmes for REDD+ (i.e. reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks) including the United Nations Collaborative Programme on REDD (UN-REDD) and the World Bank Forest Carbon Partnership Facility (FCPF), were ranked as having the largest impact. The adaptation funds (e.g. the UN Convention on Climate Change Adaptation Fund, Least Developed Countries Fund [LDCF] and the Special Climate Change Fund [SCCF]) were ranked as having the least impact and were the least known of the financing mechanisms.

Support for climate change

Following on from the constraints to implementing climate change measures, respondents were asked what assistance they would require to address climate change. The most selected options were policy and financial incentives to undertake adaptation (77%) and mitigation (74%) actions in forests. There was a clear distinction between regions, with most respondents from Africa, Asia and the Pacific and Latin America and the Caribbean indicating the need for assistance with policy and financial incentives to undertake mitigation actions. Most respondents from Europe and North America indicated that assistance with policy and financial incentives for adaptation actions would be most important. Few respondents indicated that assistance would be required to access loans (14%).

Regarding their membership in forest associations, networks or organizations, approximately two thirds of the respondents indicated that they or the company they worked for were affiliated with of one of these groups. However, only about one third of respondents received any support - *e.g. technical, financial, capacity building assistance* - for forest and climate change activities from these organizations. A higher proportion of respondents from North America and the public sector received support (~43%) compared with those from Europe, Latin America and the Caribbean and the private sector (25% each).

Overall, 73% of respondents agreed that climate change guidelines for forest managers would be a useful tool in helping them to respond to climate change challenges and opportunities. Respondents from Africa (81%) and NGOs (84%) expressed the greatest need for the guidelines with the least interest shown by respondents from North America (60%) and those from the private sector (65%).

DISCUSSION

The objective of the survey was to understand the perceptions of forest sector stakeholders across all regions on climate change and its implications for forest management. The results point to some clear distinctions between regions and stakeholder groups on some issues and highlight key areas of concern that need to be addressed to ensure that climate change is effectively addressed in the forest sector.

Unfortunately not all stakeholder groups and regions were well represented in the survey particularly community forest users groups and the Near East region. For the community forest users, this may be mainly due to the mode of distribution of the survey *i.e.* electronically. Most community groups may not have access to the internet and thus would have been unaware of or unable to access the survey. Another contributing factor could have

been that correspondence regarding the survey was sent directly to head offices and/or office bearers of community forest users' organizations, which may have infrequent communication with communities. Whatever the reason this is regrettable given the importance of this particular stakeholder group. Another survey on forest management and climate change, specifically targeting communities, will be conducted in the near future. It is vital that the viewpoint of community forest users' groups on climate change, including on the REDD+ developments, be taken into account because they represent an important stakeholder group.

The low level of responses from the Near East region may be due to lack of interest since rangelands rather than forests are significant for the region and the survey did not address this ecosystem. Forest-related networks are less developed in this region which may have limited the distribution of the survey.

Awareness & understanding of climate change

Scientific understanding and public awareness of the enormity of the threat that climate change poses to humanity and to the world's ecosystems have grown rapidly during the past few years. Therefore, the general high awareness of the impacts of climate change among respondents is not surprising. This is similar to the findings of Guariguata *et al.* (2012), who recorded a high perception of the vulnerability of forests to climate change.

The relatively higher awareness of climate change impacts among developing countries (Africa, Asia and the Pacific and Latin America & the Caribbean) as compared to industrialized countries (Europe and North America) represents an unexpected difference between these regions. This may be due to the recent focus that the forest sector has received as a major part of the REDD+ efforts. The REDD+ mechanism has the potential to generate significant financial revenues for developing countries should they reduce emissions. This has in turn raised not only expectations but also awareness of the impacts, challenges, options and opportunities of climate change in the forest sector as evidenced by the responses to that survey question.

In general, developing regions appeared to be more aware of national climate change policies affecting forest management. This may be due solely to national attempts to reduce deforestation and forest degradation and in afforestation and reforestation efforts. In several cases, new policies and strategies have been developed to reduce agricultural profitability in forested areas, increase the value of standing forests and enable forest users to capture that value and regulate land use (Angelsen *et al.* 2009). These policies aim to improve the way forests are managed and used and require adjustments in forest management practices. Incentives for these adjustments in management and use, through REDD+ has raised a lot of expectations but remains challenging mainly because REDD+ is inseparable from the highly complex social, economic and ecological realities of the forest sector.

Industrialized regions on the other hand appear to be less aware of national climate change policies that affect the forest sector. This may imply that no such policies have been developed because these regions are well advanced in their forest management or that climate change policies at international and national levels have had little impact on the management of forests. There may be marginal mitigation gains to be made through adjustments to the management and use of forests or limited financial incentives to do so. The focus of mitigation in these regions on reducing emissions has been through decreasing fossil fuel consumption.

Regardless of the level of awareness, it is important that communication within the forest sector be improved so that forest managers are made aware more quickly of decisions and changes resulting from the international and national climate change discussions, which will affect them.

The fact that there was a higher forest management response to policy changes rather than observed changes in climate suggests that the policies may be linked to incentives (real or imagined). The end result was an increased awareness of the need to adjust forest management practices to meet the needs for adaptation and mitigation for climate change.

Capacity to respond to climate change

Across all regions and stakeholder groups, respondents were confident in their capacity to implement adaptation or mitigation actions, although a large proportion of respondents, identified lack of technical knowledge as an impediment. This may mean that while individual respondents felt that they could deal with climate change issues, they still recognized the need for capacity building in the wider forest sector.

In some regions, capacity building (specifically for the implementation of REDD+ activities) is already underway through multilateral, bilateral and civil society initiatives, but most of these initiatives have been focussed on technical aspects and targeted to a limited number of national-level stakeholders. A 2011 assessment of capacity building efforts for REDD+ implementation in Asia and the Pacific, conducted by RECOFTC, found that *there are not yet sufficient 'training of trainer' services for local government and national NGOs to offer capacity building for local NGOs and community groups in technical and analytical REDD+ skills* (RECOFTC, 2011). Some exceptions exist; for example, a new GEF project *SFM Mitigating Climate Change through Sustainable Forest Management and Capacity Building in the Southern States of Mexico (States of Campeche, Chiapas and Oaxaca)* aims to take capacity building efforts to the most vulnerable populations, particularly indigenous peoples (GEF, 2011).

There is nevertheless the need to increase the scope and range of capacity building efforts on forests and climate change to ensure that all stakeholders, especially the private sector have the information necessary to make decisions on their forest management options to address climate change. Since most respondents claimed to belong to an association or network, these training activities may perhaps be effectively undertaken through these groups.

Constraints to climate change responses

Lack of financial resources was highlighted as one of the key constraints limiting forest management responses to climate change. There are usually two dimensions to this issue; namely the availability of funds and the access to funds and funding opportunities. A review of the different existing financing mechanisms showed that there are opportunities for enhancing the ability of financing mechanisms to reach poor countries and communities in developing countries by broadening their scope to be more inclusive of the forest sector, simplifying their procedures and making them more flexible (UNFCCC, 2008). This will influence the way forest sector stakeholders participate in and benefit from incentive/financing mechanisms, including the growing carbon market and REDD+ mechanisms, in order to mobilize the financial resources, technology and capacity necessary for adoption of appropriate mitigation actions and reduction of their vulnerability in the coming decades.

Lack of clarity of regulations was another major constraint highlighted by respondents even though as mentioned previously respondents had a high awareness of the existence on these regulations. Complex climate change regulations have previously been attributed to the slow pace of actions within the forest sector (FAO, 2004). To ensure implementation, perhaps regulations need to be simplified so that they are clearly understood and applicable.

Support for climate change

Most respondents indicated a requirement for policy and financial incentives to address climate change in their forest areas. Industrialized regions had a preference for incentives for adaptation, while developing regions preferred incentives for mitigation. It may be due to the perception that the potential for forest-based mitigation is higher in developing regions, a fact reflected in the substantial financial pledges for REDD+ activities in comparison to adaptation activities. In its 2010 fast-start finance report on climate change following the agreement by UNFCCC in Copenhagen in 2009 on financing, Germany highlighted the challenges of identifying suitable adaptation projects as the reason for only 21% of its 2010 reported funds being allocated to adaptation compared to its pledge of 33% (WRI, 2011). The EU mobilized 4.68 billion for fast-start and has pledged 39% for mitigation, 31% for adaptation, 12% for REDD+ and 18% for multipurpose activities. Currently, support for mitigation activities through international mechanisms including, UN-REDD and FCPF is greater than support for adaptation through the UNFCCC adaptation funds. What is clear is that forest managers need to understand the importance of coordinated planning and implementation of mitigation and adaptation activities in order to derive maximum ecological, economic and social benefits.

CONCLUSIONS

The health and vitality of many forest ecosystems is already affected by climate change and the impact is likely to accelerate, with local and global negative consequences that will possibly outweigh growth increases linked to climate change. Awareness of actual and potential impacts from climate change, assessment of uncertainties and inclusion of risks should form the backbone of climate change policies in forest management planning. The main challenge may be to promote planned adaptation and mitigation in the absence of immediate crisis especially when this may mean reducing the potential long-term gains that would be realized in the absence of climate change. Forest managers need to be proactive in their climate change actions. While being reactive may be the most natural option, this will hurt forests and society in the long term.

The difference between the perceptions of developing and industrialized countries may provide an opportunity for transfer of knowledge, skills and technology, especially where expected climate change impacts on forests (in developing countries) will mirror those currently experienced (in industrialized countries). Many developing countries face enormous deficits in information, leadership and funding essential for climate change actions within the forestry sector and are also constrained to focus on more immediate needs. In these countries, all policies related to forest-based mitigation and adaptation to climate change need to be linked with rural development and agricultural policies that focus on people, poverty alleviation, food security and livelihoods. Equity issues and technical capacity building are necessary components of the forest sector's response to climate change in developing countries and thus call for attention from the global community.

REDD+ is now high on the global climate change agenda, but it is not clear how internationally negotiated modalities and eventual national implementation will affect the people whose livelihoods depend totally or partially on forests. This potentially powerful option for climate change mitigation and adaptation can only succeed through sustainable forest management and ensuring that mitigation efforts support local adaptation of people and communities.

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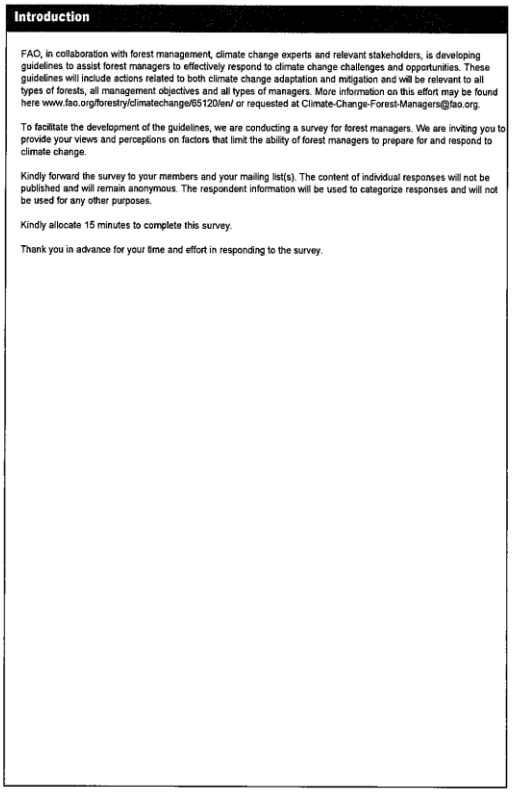
Annex I: Survey form



Introduction

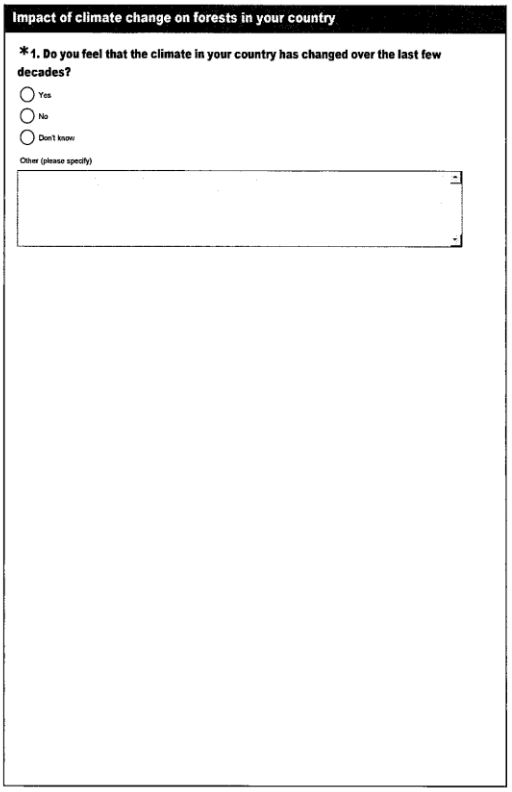
FAO, in collaboration with forest management, climate change experts and relevant stakeholders, is developing guidelines to assist forest managers to effectively respond to climate change challenges and opportunities. These guidelines will include actions related to both climate change adaptation and mitigation and will be relevant to all types of forests, all management objectives and all types of managers. More information on this effort may be found here www.fao.org/forestry/climatechange/65120/en/ or requested at Climate-Change-Forest-Managers@fao.org.

To facilitate the development of the guidelines, we are conducting a survey for forest managers. We are inviting you to provide your views and perceptions on factors that limit the ability of forest managers to prepare for and respond to climate change.

Kindly forward the survey to your members and your mailing list(s). The content of individual responses will not be published and will remain anonymous. The respondent information will be used to categorize responses and will not be used for any other purposes.

Kindly allocate 15 minutes to complete this survey.

Thank you in advance for your time and effort in responding to the survey.

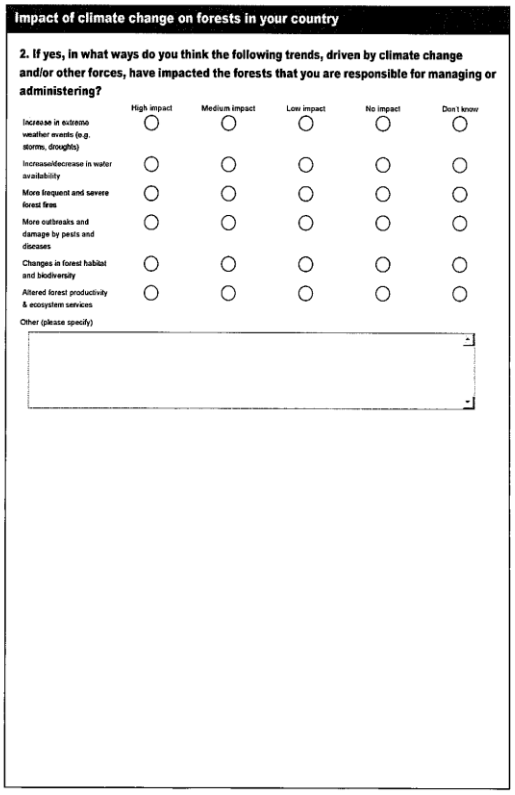


Impact of climate change on forests in your country

***1. Do you feel that the climate in your country has changed over the last few decades?**

- ◯ Yes
- ◯ No
- ◯ Don't know

Other (please specify)

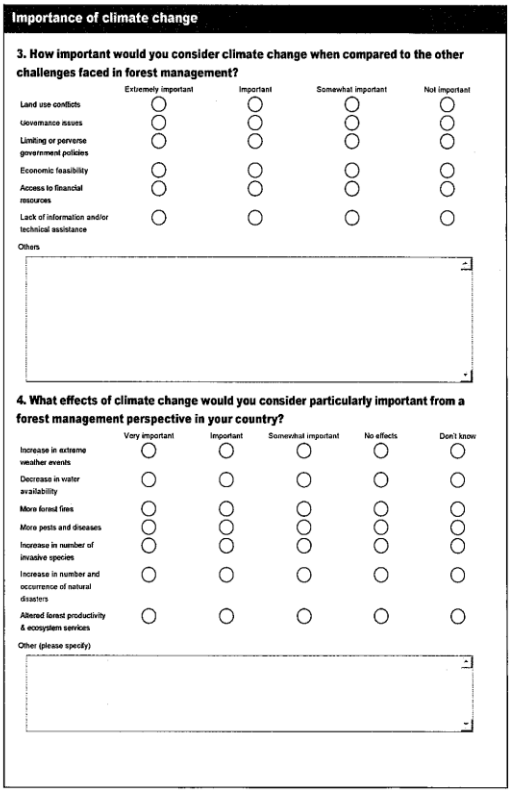


Impact of climate change on forests in your country

2. If yes, in what ways do you think the following trends, driven by climate change and/or other forces, have impacted the forests that you are responsible for managing or administering?

	High impact	Medium impact	Low impact	No impact	Don't know
Increase in extreme weather events (e.g. storms, droughts)	◯	◯	◯	◯	◯
Increase/decrease in water availability	◯	◯	◯	◯	◯
More frequent and severe forest fires	◯	◯	◯	◯	◯
More outbreaks and damage by pests and diseases	◯	◯	◯	◯	◯
Changes in forest habitat and biodiversity	◯	◯	◯	◯	◯
Altered forest productivity & ecosystem services	◯	◯	◯	◯	◯

Other (please specify)



Importance of climate change

3. How important would you consider climate change when compared to the other challenges faced in forest management?

	Extremely important	Important	Somewhat important	Not important
Land use conflicts	◯	◯	◯	◯
Ungovernance issues	◯	◯	◯	◯
Limiting or perverse government policies	◯	◯	◯	◯
Economic feasibility	◯	◯	◯	◯
Access to financial resources	◯	◯	◯	◯
Lack of information and/or technical assistance	◯	◯	◯	◯

Others

4. What effects of climate change would you consider particularly important from a forest management perspective in your country?

	Very important	Important	Somewhat important	No effects	Don't know
Increase in extreme weather events	◯	◯	◯	◯	◯
Decrease in water availability	◯	◯	◯	◯	◯
More forest fires	◯	◯	◯	◯	◯
More pests and diseases	◯	◯	◯	◯	◯
Increase in number of invasive species	◯	◯	◯	◯	◯
Increase in number and occurrence of natural disasters	◯	◯	◯	◯	◯
Altered forest productivity & ecosystem services	◯	◯	◯	◯	◯

Other (please specify)

Importance of climate change

5. How might forests and people in your country be impacted by climate change in the next decades?

	High Impact	Medium Impact	Low impact	No Impact	Don't know
Change in quantity and quality of wood supply	○	○	○	○	○
Loss of forest ecosystem services	○	○	○	○	○
Increased uncertainty in the supply of wood and non wood forest products	○	○	○	○	○
Higher production and delivery costs for forest products	○	○	○	○	○
Loss of forest based employment	○	○	○	○	○
Loss of biodiversity	○	○	○	○	○

Other (please specify)

National climate change laws and regulations

***6. Has your government developed national policies, strategies or legislation aimed at climate change that have a direct or indirect impact on the forest sector?**

○ Yes
○ No
○ Don't know

If applicable, kindly indicate what policy or legislative changes have been introduced

National climate change laws and regulations

7. If yes, have you made changes to your forest management plans, practices or reporting procedures as a result of the related government policy changes?

○ Yes
○ No

If applicable, please elaborate on changes made

Climate change related adaptation and mitigation responses

In the context of climate change, mitigation refers to efforts to reduce human-induced causes of climate change, whereas adaptation refers to measures to reduce negative impacts or to capture benefits of climate change.

Forest-based mitigation measures include those that prevent greenhouse gas emissions (e.g. avoiding carbon loss by reducing deforestation and forest degradation),that conserve forest carbon stocks (e.g. forest conservation and reduced impact logging),or that increase forest carbon stocks (e.g. afforestation, reforestation and forest rehabilitation).

Adaptation measures in forestry could include e.g. silvicultural adjustments, increased forest fire management and diversifying production to reduce financial risk to changing markets.

8. Have you, your company or organization made modifications to forest management plans or practices due to the impacts of climate change on the forests you manage?

○ Yes
○ No
○ Don't know

If yes, please explain

Climate change related adaptation and mitigation responses

9. In your view, what impact will current or anticipated financial support mechanisms have on forest management?

	High impact	Medium impact	Low impact	No impact	Don't know this initiative
Current REDD+ support programmes (e.g. UN-REDD, FCPF)	○	○	○	○	○
Future REDD+ instrument under UNFCCC	○	○	○	○	○
Clean development mechanism (CDM)	○	○	○	○	○
Adaptation funds (e.g. UNFCCC, GEF, LDCF)	○	○	○	○	○

Other (please specify)

Capacities and support to undertake climate change adaptation and mitigatio...

10. Do you understand the effects of climate change on forests and the options for climate change adaptation and mitigation?

	Well understood	Somewhat understood	Not understood	Don't know
Effects of climate change on forests	○	○	○	○
Forest adaptation options	○	○	○	○
Forest mitigation options	○	○	○	○

Please elaborate on your source(s) of information

11. As a forest manager do you feel that you have the capacity to undertake climate change adaptation and mitigation actions?

- ○ Yes
- ○ No
- ○ Don't know

12. In your view, what are the greatest constraints limiting forest managers' ability to undertake climate change adaptation and mitigation actions in your country?

- ☐ Lack of technical knowledge
- ☐ Lack of finances or financial incentives
- ☐ Lack of interest
- ☐ Lack of conviction that it is important
- ☐ Lack or poor access to information
- ☐ Lack of clarity of existing regulations

Other (please specify)

Capacities and support to undertake climate change adaptation and mitigatio...

13. In your opinion, what assistance would you require to address climate change in your forest area?

- ☐ Policy and financial incentives to undertake mitigation
- ☐ Policy and financial incentives to undertake adaptation
- ☐ Access to loans
- ☐ Improved access to technical information
- ☐ Improved access to training and technical assistance
- ☐ Improved public awareness on forests and climate change
- ☐ Information on carbon markets

Other (please specify)

14. Are you/your company a member of a forest association, network, other organization or group?

- ○ Yes
- ○ No

Name of association or network, other organization or group

Capacities and support to undertake climate change adaptation and mitigatio...

15. Do you receive any support e.g. technical, financial, capacity building etc.) related to forest management and climate change issues?

- ○ Yes
- ○ No

If yes, please specify the type and the origin of that support

16. Please provide any further comments, suggestions or recommendations you may have on the survey.

Climate change guidelines for forest management

*17. As a forest manager, would climate change guidelines for forest managers (aimed at assisting them in responding to climate change challenges and opportunities) be useful for you?

- ◯ Yes
- ◯ No
- ◯ Not sure

Climate change guidelines for forest management

18. If yes, kindly indicate key issues that you believe should be covered in the guidelines.

Background information

*19. Your country is

*20. In which of the following sectors would you consider yourself?

- ◯ Private sector
- ◯ Public sector
- ◯ Community based organization
- ◯ Non governmental organization
- ◯ Education or research organization

Other (please specify)

Background information

*21. What is your role in the company/organization?

- ◯ Policy and planning
- ◯ Operational (field)
- ◯ Marketing

Other (please specify)

22. What is/are the main management objective(s) for the forests you manage?

- ☐ Timber production
- ☐ Soil and water protection
- ☐ Biodiversity conservation
- ☐ Multi-purpose

Other (please specify)

23. How many years of work experience do you have in the forest sector?

- ◯ 0-4 years
- ◯ 5-9 years
- ◯ 10-14 years
- ◯ 15 years or more

Background information

24. Gender

- ◯ Male
- ◯ Female

25. If you are willing to be further contacted about your survey responses, kindly provide your contact details.

Name	
Company	
Email Address	
Phone Number	

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